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EXAMINER

COOLEY, CHARLES E

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/619,688

Applicant(s)

STREIFF ET AL.

Examiner

Charles E. Cooley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 17-25 is/are rejected.
- 7) ☒ Claim(s) 15 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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FINAL OFFICE ACTION

1. This application remains been assigned to Technology Center 1700, Art Unit 1723 and the following will apply for this application:

Please direct all written correspondence with the correct application serial number for this application to Art Unit 1723.

Telephone inquiries regarding this application should be directed to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 or to the Examiner at (571) 272-1139. All official facsimiles should be transmitted to (571) 273-8300.

Priority

2. Acknowledgment is made of applicant's claim for domestic priority under 35 U.S.C. § 119(e).

Specification

3. The abstract is acceptable.
4. The title is acceptable.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-14 and 17-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Horner (US 4,093,188).

The patent to Horner (US 4,093,188) discloses a static mixer 20 and method of constructing said static mixer comprising providing a first grid 32 comprising one or more crossing elements 38 and one or more slots adjacent to each crossing element 38 (Fig. 2 and col. 4, lines 60-63) and providing a second grid 34 comprising one or more crossing elements 38' and one or more slots adjacent to each crossing element 38' (Fig. 2 and col. 4, lines 60-63) wherein said crossing elements 38 of said first grid 32 are arranged at intersecting angles to said crossing elements of said second grid (Fig. 2 and col. 4, lines 19-23); and positioning at least one elongated connector 36 positioned between and secured to said crossing elements 38 of said first grid and said crossing elements 38' of said second grid; said grids 32, 34 are arranged such that each crossing element of one grid intersects a slot in the other grid (Fig. 2); said crossing elements 38 of said first grid 32 are in a generally parallel relationship relative to one another (col. 3, lines 60-64); said crossing elements 38 of said first grid 32 lie within a common plane (Figs. 2 and 4); said crossing elements 38' of said second grid 34 are in generally parallel relationship relative to one another (col. 3, line 67 through col. 4, line 3); said crossing elements 38 of said second grid lie 34 within a common plane (Figs. 2 and 4); said crossing elements are one of corrugated plates and tubes (col. 5, lines 37-48); the static mixer 20 comprises more than two grids (e.g., the series of crossing elements 40 can be considered another grid and the series of crossing elements 40' can be

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considered yet another grid or see Fig. 10 and col. 5, lines 25-36 which explicitly teaches more than two grids); wherein each grid of the multiple grids comprises crossing elements such as 80, 82, 84 in Fig. 10 or the aforementioned crossing elements 40 and 40'; said crossing elements of each grid are arranged at intersecting angles to one another (such as 80, 82, 84 in Fig. 10 or the aforementioned crossing elements 40 and 40'); said connector 36 is positioned between said crossing elements of each grid as seen in Fig. 2; said crossing elements are one of metal, polymeric, ceramic construction or combinations thereof (col. 6, lines 29-41); said connector 36 extends continuously along the entire cross-sectional length of said static mixer (Fig. 1); said elongated connector 36 is positioned so that it intersects with said crossing elements along at least some of their points of intersection (Figs. 2 and 4); said crossing elements being secured to said connector by one of welding, brazing, gluing and combinations thereof (col. 6, lines 29-41); the static mixer including a generally ring-shaped fluid flow conduit 22 having a central axis, concentric inner and outer, radially spaced, circumferentially extending surfaces (Fig. 1); said inner surface defining a fluid flow path which extends along said axis (Fig. 1).

More particularly, the patent to Horner '188 discloses a static mixer that utilizes a mixing element comprising at least two banks of stationary baffle plates arranged around an axis which is parallel to the overall direction of flow of the fluids to be mixed. The baffle plates in each bank are inclined at an angle to the flow axis and inclined at an angle to the baffle plates of each adjacent bank, such that apertures are formed by abutting baffles at the interface between adjacent banks. Each bank contains one set of

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substantially parallel baffles spaced along the axis, and at least one of the banks contains a second set of substantially parallel baffles spaced along the axis and interspersed, preferably alternating, with the baffles of the first set. The baffles of the second set are similarly inclined to the axis as the first set, but at an angle different from the inclination of the baffles of the first set such that the plane of each baffle in the second set intersects the plane of at least one baffle in the first set at an intersection near the outer edges of the baffles. If desired, all of the banks of baffles may have both types of sets. In a preferred embodiment there are two banks of baffles in the mixing element with the baffles in one bank slanted at an angle opposite to the baffles in the other bank. The mixing element may be used in a tubular housing where the outer edges of the baffles correspond substantially in circumferential profile to the inner wall of the tubular housing.

In FIG. 1 a static mixer indicated generally as 20 according to one embodiment of the present invention. The mixer 20 comprises a tubular housing 22 having a fluid inlet 24, a fluid outlet 26 and a mixing zone 28. The housing 22, inlet 24 and outlet 26 may have any desired configuration, depending upon the particular application involved, and do not form any part of the present invention. Adapted to fit in mixing zone 28 is a mixing element indicated generally as 30. Element 30 comprises two banks 32 and 34 (as best seen from the top or bottom in FIG. 4) of semi-elliptical baffle plates arranged on either side of a central shaft 36. As shown in FIGS. 1 and 2, shaft 36 lies along the longitudinal axis of mixing element 30 which is parallel to the overall or superficial direction of flow of fluids through the tubular housing.

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As shown in FIGS. 1 and 2, each bank of mixing element 30 comprises two different sets of baffle plates having different inclinations to the axis or shaft 36, but the inclinations are similar in that they are both on the same side of the perpendicular to the axis. Thus, the bank in front of the shaft in FIGS. 1 and 2, which will be referred to as front bank 32 includes a first set of baffle plates 38, parallel to each other and equally spaced along the longitudinal axis, and a second set of baffle plates 40, also parallel to each other and equally spaced along the longitudinal axis, but interspersed and alternating with baffle plates 38. Similarly, the bank to the rear of shaft 36 as illustrated in FIGS. 1 and 2, which will be referred to as rear bank 34, includes a first set of baffle plates 38' which are parallel to each other and equally spaced along the longitudinal axis, and a second set of baffle plates 40' which are also parallel to each other and equally spaced along the longitudinal axis but interspersed and alternating with baffle plates 38'. The baffles of both sets are perpendicular to the interface between the banks.

In order to conform to the circular cross section of housing 22, as shown in FIG. 4, baffle plates 38 and 40 and 38' and 40' are in the form of truncated ellipses or semi-ellipses, as best shown in FIG. 5. Thus, the inner edge of a baffle plate corresponds to the major axis of an ellipse, and the outer or peripheral edge of a baffle plate conforms to the inner wall of the tubular housing to form a substantially fluid tight engagement between the outer edge of the baffle plate and the inner wall of the housing.

As shown in FIGS. 1 and 2, the first set baffle plates 38 and 38' of each bank are inclined to the longitudinal axis at an angle of approximately 45 degrees, and the

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second set baffle plates 40 and 40' of each bank are inclined to the longitudinal axis at an angle of approximately 30 degrees. As a result of these different angles, each bank of baffle plates consists of a series of semi-elliptical wedge shaped passages which alternately converge or narrow and diverge or widen in the general direction of flow of the fluids.

Depending upon the particular spacing of the baffle plates in each set and the particular angles of inclination to the longitudinal axis, each baffle plate of the second set may intersect one or more baffle plates of the first set at or near the outer peripheral edges of the baffle plates. As shown in FIGS. 1 and 2, it is preferred that the baffle plates 40 and 40' of the second sets intersect with the two adjacent baffle plates 38 and 38' of the first sets just inside the outer peripheral edges of the baffle plates.

Depending upon the method of manufacture of the mixing element 30, all of the baffle plates may be attached to central shaft 36 and/or to the baffle plates of the adjacent bank along the abutting inside edges of the baffle plates. Whether or not the baffle plates of adjacent banks are actually affixed or connected at the abutting points along the interface between the banks, a multiplicity of apertures or windows are formed along the interface, as best shown in FIG. 2.

In FIG. 2, each diverging wedge-shaped passage has a plurality of apertures 42 through 58 along the interface with the baffle plates of the rear bank. Similarly, each converging wedge-shaped passage has a plurality of apertures 60-74 along the interface with the rear bank of baffle plates. Since the fluids being mixed will spiral downwardly through the mixing zone, as more fully described below, apertures 42, 44,

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46 and 48 will serve as inlet or feed apertures for each diverging wedge-shaped passage, and apertures 50, 52, 54, 56 and 58 will serve as outlet or exit apertures for each diverging wedge-shaped passage. Similarly, apertures 60, 62, 64, 66 and 68 will serve as inlet or feed apertures for each converging passage and apertures 70, 72 and 74 will serve as outlet or exit apertures for each converging passage.

Apertures near the shaft 36, such as apertures 48, 50, 68 and 70 may conceivably serve as either inlets or outlets for fluid streams. Similarly, in the alternate embodiment shown in FIG. 9 where no central shaft is used, apertures near the center or axis of the element 30, such as apertures 76 and 78, may serve as either inlets or outlets for fluid streams. Since the embodiment of FIG. 9 uses no central shaft, the baffle plates of each bank may be conveniently affixed to each other at the points of contact or abutment along the interface between the banks.

In FIGS. 6, 7 and 8, there is shown another embodiment of a static mixer according to the present invention. This embodiment is identical to the embodiment shown in FIGS. 1, 2 and 3, except that the rear bank of baffle plates in FIG. 6 (the front bank in FIG. 8) does not include a second set of baffle plates 40' (as in FIGS. 1-3), but only a first set of baffle plates 38'. Hence, although the front bank 32 in FIGS. 6 and 7 (the rear bank in FIG. 8) is still made up of a series of alternately converging and diverging passages, the rear bank 34 is made up of a series of passages having parallel walls. This type of arrangement produces a different flow pattern in each side or bank of the static mixer. As with the embodiments shown in FIGS. 1-3 and 9, the embodiment shown in FIGS. 6-8 can be with or without central shaft 36, as desired.

Although the embodiments shown in FIGS. 1-9 have employed only two banks of semi-elliptical baffles, more than two banks of baffles could be used for the mixing element. For example, the embodiment shown by the top or bottom view in FIG. 10 comprises three banks 80, 82 and 84 of baffle plates in the form of elliptical sectors. Each bank of the embodiment shown in FIG. 10 may contain both a first and a second set of baffle plates, similar to the embodiment in FIGS. 1-3, or alternatively one or two of the banks may contain only a first set of baffle plates, similar to the embodiment shown in FIGS. 6-8.

Although the baffles shown in the drawing are relatively thin, flat, solid plates, they could be made curved or undulating or angled, as desired. The baffles could also be made of varying thicknesses and provided with fins or surface protrusions of various kinds. It is also possible to provide the baffles with holes which would allow small streams of fluid to pass directly between adjacent passages in the same bank. Further, although the embodiments shown in the drawings have banks of equal sizes and baffles of equal elliptical sectors, the banks and baffles could be varied in size and proportion to the cross section of the mixing element. For example, instead of using three equal banks as shown in FIG. 10, the mixing element could be divided instead into two quarter circle banks of quarter elliptical baffles and one semi-circular bank of semi-elliptical baffles. Other possible variations will be readily apparent to those skilled in the art in view of the above disclosure.

Other possible variations within the scope of the present invention include changing the angles of the various sets of baffles with respect to the longitudinal axis,

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and with respect to corresponding sets in adjacent banks of baffles. For example, a bank's first set may be at a different angle of inclination with respect to the axis than an adjacent bank's first set. Although the baffles may assume virtually any angle of inclination to the axis, it is usually desirable that the first set of baffles have an inclination to the axis of between about 30 degrees and 70 degrees, and preferably about 45 degrees. Similarly, it is usually desirable that the second set of baffles have an inclination of between about 20 degrees and about 50 degrees to the axis, and preferably about 30 degrees. Also, the angle of intersection between alternating baffles of the two sets is desirably between about 10 degrees and about 20 degree, and preferably about 15 degrees. The intersections of the imaginary planes of the adjacent baffles of the first and second sets may be either inside or outside of the housing wall, but should be near the wall and preferably just inside the wall so that there is actual contact between adjacent baffles of the two sets.

Another possible variation within the scope of the invention would be to include in one or more of the banks a third set of baffles alternately interspersed among the first and second set baffles. In this variation, the passages would not alternate between converging and diverging, but would have multiple permutations such as converging passages alternating with two adjacent diverging passages. The sizes and shapes and the size distributions of the interfacial apertures may be changed by shifting the banks longitudinally with respect to each other.

The mixing element of the present invention may be manufactured in various manners depending upon the size and complexity of the element. For example, for

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larger elements metal baffles may be welded to a central metal shaft to form the element. For smaller elements, it may be most economical and convenient to injection mold the element with any of a wide variety of polymers, either as a single piece or as several pieces. As will be apparent, the mixing element may be designed in any desired cross sectional configuration to correspond to tubular housings of various shapes, including ellipses and other geometrical shapes, as well as circular cross sections.

7. Claims 1-6, 8-11, 13-14, and 17-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Doom (US 4,072,296).

The patent to Doom (US 4,072,296) discloses a static mixer 2 and method of constructing said static mixer comprising providing a first grid of elements 22 comprising one or more crossing elements 22 and one or more slots adjacent to each crossing element (Figs. 1 or 3) and providing a second grid of elements 20 comprising one or more crossing elements 20 and one or more slots adjacent to each crossing element (Figs/ 1 or 3) wherein said crossing elements 22 of said first grid are arranged at intersecting angles to said crossing elements 20 of said second grid (Figs. 1 or 3); and positioning at least one elongated connector 8 positioned between and secured to said crossing elements 22 of said first grid and said crossing elements 20 of said second grid; said grids are arranged such that each crossing element of one grid intersects a slot in the other grid (Figs. 1 or 3); said crossing elements 22 of said first grid are in a generally parallel relationship relative to one another (Figs. 1 or 3); said crossing elements 22 of said first grid lie within a common plane (Figs. 1 or 3); said crossing elements 20 of said second grid are in generally parallel relationship relative to one

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another (Figs. 1 or 3); said crossing elements 20 of said second grid lie within a common plane (Figs. 1 or 3); the static mixer 2 comprises more than two grids (10, 12, 14, 16, etc.); wherein each grid of the multiple grids comprises crossing elements such as 20, 22, 30, 32; said crossing elements of each grid are arranged at intersecting angles to one another (Figs. 1 or 3); said connector 8 is positioned between said crossing elements of each grid as seen in Figs 1 or 3); said connector 8 extends continuously along the entire cross-sectional length of said static mixer (Figs. 1 or 3); said elongated connector 8 is positioned so that it intersects with said crossing elements along at least some of their points of intersection (Figs. 1 or 3); the static mixer including a generally ring-shaped fluid flow conduit 4 having a central axis, concentric inner and outer, radially spaced, circumferentially extending surfaces (Figs. 1-4); said inner surface defining a fluid flow path which extends along said axis (Figs. 1-4).

Although welding as means of securing elements together is a well-known concept in the art as expressed in the other rejections, with respect to claim 17, the product-by-process limitation (i.e., the manner in which the crossing elements are secured to the connector) does not impart patentability to the claims per MPEP 2113 since there is no apparent structural difference between the crossing elements/connector of Doom and the product set forth by claim 17. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even

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though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

More particularly, the patent to Doom '296 discloses a motionless mixer 2 as shown in FIG. 1 includes a hollow conduit 4 defining a channel 5 and a baffle assembly 6 which is mounted longitudinally within the channel 5. The baffle assembly 6 includes an elongated support member 8, which may be a cylindrical rod, arranged substantially along the longitudinal axis of the conduit 4. A slot 7 is formed in a first lateral end surface 9 of the member 8. A plurality of baffles 10, 12, 14 and 16 are attached at equally spaced longitudinal points along the member 8. Each of these baffles includes a first and a second mutually orthogonal hemi-elliptical blades. Baffle 10, for example, includes hemi-elliptical blades 20 and 22, while baffle 12 includes the hemi-elliptical blades 30 and 32. The two blades of each baffle are attached to opposed sides of member 8 and are arranged so that they are mutually orthogonal as seen for instance in blades 20 and 22 of baffle 10. Elliptical apertures such as 34 in blade 30 and 36 in blade 32 may be provided in inner side of each of the baffle blades. The blades can then be attached to member 8 along the surfaces defined by these apertures. Each baffle, such as 12, is rotated 90 degrees with respect to adjacent baffles such as 10 and 14. In order to provide adequate mixing or blending of fluids introduced into the tubular member 4 each of the hemielliptical blades, such as 20, 22, 30 and 32 of the baffles 10 and 12 of baffle assembly 6 extend outwardly from the member 8 so that their outer edges are located immediately adjacent to the inner surface of the conduit 4.

In order to hold the baffle assembly 6 in a stable orientation within the conduit 4 a cross member 36 is attached across the channel 5. This cross member 36, as best seen in FIG. 2, is fixedly attached at its ends 35 and 37 to opposed sides of the inner surface of the conduit 4. The cross member may be attached by welding, soldering or other suitable process. The cross member 36 includes a portion 38 of decreased cross sectional area which is arranged about the center of member 36 and is best seen in FIG. 2.

When the baffle assembly 6 is inserted into the conduit 4, slot 7 in the end 9 of member 8 mates with the portion 38 of cross member 36. Pressure from the fluid which flows in channel 5 in the direction indicated by arrows 11 of FIG. 1 pushes the baffle assembly 6 downstream holding the slot 7 of member 8 in firm contact with portion 38 of cross member 36 thereby maintaining the baffle assembly 6 in a substantially uniform longitudinal position within the channel 5. By the mating slot 7 with the portion 38 of cross member 36, the baffle assembly 6 is also prevented from rotation about its longitudinal axis within the channel 5. The presence of cross member 36 thereby provides both rotational and longitudinal stability for the baffle assembly 6 within the channel 5.

By utilizing a cross member 36 having a portion 38 of decreased cross sectional area, a cross member 36 may be provided having maximum width and therefore strength at its end points 35 and 37 which are connected to the inner wall of conduit 4 while having a narrower central portion to mate with the slot 7 in member 8. Since a member 8 having too great a cross sectional area would hinder fluid flow, a member of limited cross sectional area is desirable. The cross sectional area of member 8 limits the practical size of slot 7 which must be narrower than the total distance across the member. Providing a cross member 36 having an area of decreased cross sectional area 38 permits the utilization of a narrower slot 7 and thereby provides more strength for the end 9 of member 8.

Alternatively the downstream end 9 of the supporting member 8 may include an enlarged flared portion 40 as shown in FIGS. 3 and 4. Since the portion 40 is enlarged a slot 42 can be formed in the end 9 which is slightly wider than the full distance across cross member 36. In this embodiment the whole cross sectional area of cross member 36 is available to support the baffle assembly 6. Because of the enlarged portion 40 the end 9 of member 8 is not unduly weakened by the presence of the relatively wide slot 42. Since the enlarged portion 40 is only provided adjacent to the end 9 it provides minimum resistance to fluid flowing the conduit 4. As in the embodiment described above with reference to FIGS. 1 and 2 the slot 42 provides rotational and longitudinal stability for baffle assembly 6.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doom (US 4,072,296) in view of Horner (US 4,093,188).

Doom (US 4,072,296) does not disclose the recited material of the crossing elements. As noted above, the patent to Horner discloses a static mixer with crossing elements that may be formed of metal or polymeric materials (col. 6, lines 29-41). It would have been obvious to one having ordinary skill in the art, at the time applicant's invention was made, to have formed the crossing elements in Doom (US 4,072,296)

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from the one or more of the recited materials of instant claim 12 as taught by Horner for the purpose of manufacturing the static mixer as a function of the size and complexity of the mixer (col. 6, lines 29-31). Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416; *Sinclair & Carroll Co., Inc. v. Interchemical Corp.*, 65 USPQ 297 (1945).

Furthermore, in view of the fact that the use of the materials recited in claim 12 vis-à-vis any other common construction material solves no stated problem insofar as the record is concerned and the conclusion of obviousness can be made from the common knowledge and common sense of one of ordinary skill in the art (*In re Bozek*, 416 F.2d 1385, 163 USPQ 545 (CCPA 1969)), it would have been obvious to one of ordinary skill in the art to have formed any of the components of the prior art static mixers from well-known construction materials such as those recited in instant claim 12. *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975).

It is observed that artisans must be presumed to know something about the art apart from what the references disclose (see *In re Jacoby*, 309 F.2d 513, 135 USPQ 317 (CCPA 1962)). Moreover, skill is presumed on the part of those practicing in the art. See *In re Sovish*, 769 F.2d 738, 226 USPQ 771 (Fed. Cir. 1985). Therefore, it is concluded that the selection of a well-known material in the art such as metal, polymeric material, or ceramic material would have been obvious to one of ordinary skill in this art, if for no other reason than to achieve the advantage of using a more modern material or a lower cost or more easily fabricated material.

Allowable Subject Matter

11. Claims 15-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is an Examiner's statement of reasons for the indication of allowable subject matter:

The prior art of record does not teach or fairly suggest the connector having crossing grooves positioned along the lines of contact of the crossing elements with the connector to provide a larger bonding surface and mechanical fitting for holding the crossing elements together.

Response to Amendment

13. Applicant's arguments filed 28 JUN 2005 have been fully considered but they are not deemed to be persuasive.

Applicant is reminded that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, i.e., identity of

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terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Turning to the rejection of the claims under 35 U.S.C. § 102(b), it is noted that the terminology in a pending application's claims is to be given its broadest reasonable interpretation (*In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989)) and limitations from a pending application's specification will not be read into the claims (*Sjolund v. Musland*, 847 F.2d 1573, 1581-82, 6 USPQ2d 2020, 2027 (Fed. Cir. 1988)). Anticipation under 35 U.S.C. § 102(b) is established only when a single prior art reference discloses, either expressly or under the principles of inherency, each and every element of a claimed invention. See *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1570, 7 USPQ2d 1057, 1064 (Fed. Cir.), cert. denied, 488 U.S. 892 (1988); *RCA Corp. v. Applied Digital Data Sys., Inc.*, 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984). Moreover, anticipation by a prior art reference does not require either the inventive concept of the claimed subject matter or the recognition of properties that are inherently possessed by the prior art reference. *Verdegaal Brothers Inc. v. Union Oil co. of California*, 814 F.2d 628, 633, 2 USPQ2d 1051, 1054 (Fed. Cir. 1987), cert. denied, 484 U.S. 827 (1987). A prior art reference anticipates the subject matter of a claim when that reference discloses each and every element set forth in the claim (*In re Paulsen*, 30 F.3d 1475, 1478-79, 31 USPQ2d 1671, 1673 (Fed. Cir. 1994) and *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990)); however, the law of anticipation does not require that the reference teach what Applicant is claiming, but only that the claims "read on" something disclosed in the

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reference. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 772, 218 USPQ 781, 789 (Fed. Cir. 1983), cert. denied, 465 U.S. 1026 (1984) (and overruled in part on another issue), *SRI Intel v. Matsushita Elec. Corp. Of Am.*, 775 F.2d 1107, 1118, 227 USPQ 577, 583 (Fed. Cir. 1985). Also, a reference anticipates a claim if it discloses the claimed invention such that a skilled artisan could take its teachings in combination with his own knowledge of the particular art and be in possession of the invention. See *In re Graves*, 69 F.3d 1147, 1152, 36 USPQ2d 1697, 1701 (Fed. Cir. 1995), cert. denied, 116 S.Ct. 1362 (1996), quoting from *In re LeGrice*, 301 F.2d 929, 936, 133 USPQ 365, 372 (CCPA 1962).

With respect to the applied prior art under 35 U.S.C. § 102(b), the examiner has explicitly demonstrated how the Horner and Doom references disclose each and every element set forth in the claims and how the pending claims read on the disclosures of the references, hence the rejections are considered proper.

With respect to the patent to Horner '188, the banks 32 and 34 can be deemed "grids" within the broad scope of that term. The pending independent claims merely require that the crossing elements of each grid be arranged at "intersecting angles" which is clearly seen in Figs. 1 and 2. Clearly the elements 38 or 40 (in the first grid) and elements 38' or 40' (in the second grid) are disposed at intersecting angles to each other as depicted in the Figures. Note also, Horner contemplates the elements themselves intersecting at col. 4, lines 29-37. The elements 38, 40, 38', and 40' can be deemed "crossing elements" within the broad scope of that term as well since they are elements disposed in a crossing relationship. The regions between the elements that

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are unoccupied can be considered "slots". Applicant's emphasis on "solid plates" is not understood as the elements 16 of the instant invention appear to be solid plate elements. Even more remarkably, note the pending apparatus claims are so broad as to read on just one element 38, another element 38', and the connector 36 since the each grid only requires "one or more crossing elements". Applicant is apparently construing the claims much too narrowly.

With respect to EP 1067352, the rejection is withdrawn in view of Applicant's remarks.

With respect to Doom '296, the elements 20 and 22 on either side of the connector 8 can also be deemed "grids" within the broad scope of that term. The pending independent claims merely require that the crossing elements of each grid be arranged at "intersecting angles" which is clearly seen in Figs. 1 and 3. Clearly the elements 22 (in the first grid) and elements 20 (in the second grid) are disposed at intersecting angles to each other as depicted in the Figures. The elements 20 and 22 can be deemed "crossing elements" within the broad scope of that term as well since they are elements disposed in a crossing relationship. The regions between the elements that are unoccupied can be considered "slots". Applicant's emphasis on "solid plates" is again not understood as the elements 16 of the instant invention appear to be solid plate elements. As noted above, note the pending apparatus claims are so broad as to read on just one element 20, another element 22, and the connector 8 since the each grid only requires "one or more crossing elements". The remarks drawn to the "cross member" 36 are not relevant to the rejection, since the examiner is not relying on

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this member 36 for any aspect of the rejection and is not asserting the cross member 36 is in any way equivalent to the crossing elements of the pending claims. Applicant is again apparently construing the claims much too narrowly.

Accordingly, when giving the terminology in this application's claims its broadest reasonable interpretation and not reading limitations from the specification into the claims, as the examiner is required to do, the claims fall victim to the prior art patents of Horner and Doom.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION. ANY RESPONSE FILED AFTER THE MAILING DATE OF

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THIS FINAL REJECTION WILL BE SUBJECT TO THE PROVISIONS OF MPEP 714.12 AND 714.13.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles E. Cooley whose telephone number is (571) 272-1139. The examiner can normally be reached on Mon-Fri. All official facsimiles should be transmitted to the centralized fax receiving number 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Charles" followed by a stylized flourish.

Charles E. Cooley
Primary Examiner
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8 September 2005